

Revised: February 7, 2002

PART 1: LANDSCAPE IRRIGATION EFFICIENCY ORDINANCE

SHORT TITLE.

This article shall be known as the Irrigation Efficiency Ordinance.

INTENT

- (A) To encourage consistent irrigation and landscape standards across jurisdictions in the Tucson area.
- (B) To reduce the use of groundwater for irrigation, reduce overall per capita water use and encourage use of renewable water resources such as reclaimed and Central Arizona Project (C.A.P.) water for irrigation in the Tucson metropolitan area.
- (C) To encourage the use of harvested rainwater on public and private landscapes to reduce the use of potable water for landscape irrigation.
- (D) To reduce irrigation-related water waste in commercial, industrial and publicly owned landscapes.
- (E) To reduce irrigation water usage without sacrificing landscape quality by establishing better irrigation systems, maintenance practices and watering schedules, and through the use of low water use plants, improved planting design and appropriate planting practices.
- (F) To reduce water waste from over-watering, inefficient watering, or release of excess water which generates fugitive water in the public right-of-way. To reduce damage to publicly owned streets and the public expenditures necessary to repair the damage caused by wasted water.
- (G) To apply equally stringent requirements at publicly owned government facilities to lead by example.

DEFINITIONS

For the purpose of this article, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

AREA – Square footage or acreage measured and calculated from scale plans, photographs, or from on-site measurements.

ATHLETIC FIELD- A turf area used primarily for organized sports.

BODIES OF WATER- Include fountains, swimming pools, spas, water sculptures, canals, channels, waterfalls, constructed ponds and lakes, or other elements using water as part of a design.

CEMETERY- An area of land being used for cemetery related purposes, including: any area of land covered by grave markers and landscaping and excluding: buildings; walks; pathways; roads; parking lots; and any area of land being held for future expansion of the cemetery.

CHANGE OF OWNERSHIP - when the legal deed to a property and its structures are transferred to a new owner through a sale, exchange, gift or inheritance of said property.

COMMON AREA - A recreational or open space area or areas owned and operated as a single integrated facility and maintained for the benefit of the residents of a housing development.

COMMERCIAL FACILITY- any commercial or industrial use facility with a landscapable area of ½ acre or more, including offices and retail centers.

COMMERCIAL USE - The buying, selling, leasing, or storage of real or personal property or the furnishing of services for compensation. The term shall also include manufacturing, warehousing, the parking or storage of equipment, machinery, or supplies to be utilized elsewhere for compensation.

DEVELOPMENT- Any permitted or non permitted human alteration to land and its vegetation, soil, geology, drainage, hydrology and surface features, that changes the appearance and character of land; including but not limited to the acts of grubbing, clearing, and grading of land, and placing improvements on the land such as buildings, structures, signs, paving, vegetation, and outdoor use areas.

DISTRIBUTION UNIFORMITY (d.u.)- An accepted industry standard method used to rate how evenly water is applied to an irrigated area. The more evenly the water is applied, the higher the rating. Distribution uniformity is directly related to irrigation system performance.

DRIP IRRIGATION - A low pressure, low volume irrigation system of pipe and emitters that applies water slowly, near or at ground level to minimize runoff and loss to evaporation.

EFFICIENCY STANDARD – A value or criterion that establishes a volume of irrigation water use in the ornamental landscape.

EMISSION UNIFORMITY - Applied to drip and micro irrigation, is a comparison of the total output flow from the lowest rate 25% of the emitters on the system compared to the total average emitter flow of the system.

EMITTER – An irrigation system component that dispenses water to plants at a predictable rate, measured in gallons per hour, used with drip irrigation, bubblers and micro-spray systems.

EXPANSION OR MAJOR RENOVATION- Any expansion or major renovation to a commercial or industrial use facility that increases its landscapable area to ½ acre or more. Or, any major renovation to building(s) or landscape area(s) that reduces the total square footage of landscapable or landscaped area that was calculated and submitted on the previously approved landscape plan.

FIXED SPRAY IRRIGATION- The application of water to landscaping by means of a fixed spray device that projects water through the air, in the form of small particles or droplets over an area, typically $\leq 20'$ radius.

HARVESTED RAINWATER- Precipitation runoff collected, directed or stored that is available for use on landscaping to sustain the plantings or to supplement irrigation.

INSPECTION - An entry into and examination of a premises for the purpose of ascertaining the existence or nonexistence of violations of this article.

IRRIGATION CONTROLLER – A mechanical or electronic clock that can be programmed to operate remote-control valves.

IRRIGATION EFFICIENCY – Refers to the relationship between the horticultural needs of the plants being watered and the amount of water actually applied.

LANDSCAPABLE AREA - The entire parcel including privately owned medians, less the building footprint, driveways, non irrigated portions of parking lots and required off-street parking.

LOW WATER USE PLANTS - Plants that are able to survive with minimal or no supplemental water once established, as specified in the "Arizona Department of Water Resources (ADWR) Low Water Use/Drought Tolerant Plant List" published by the state and updated annually for the Tucson Active Management Area.

MASTER PLANNED COMMUNITY- A development that is either: 1) subject to a master declaration of covenants, conditions or restrictions; 2) is subject to restrictive covenants sufficiently uniform in character to clearly indicate a general scheme for improvement or development of real property, or 3) is governed or administered by a master owners association.

MAYOR - The Mayor of XXXXX or his/her designated representative.

MINI OASIS ALLOWANCE - A certain percentage of the land area on a site where plants not listed on the ADWR Drought Tolerant Plant List may be used, and that is located where the oasis will return maximum benefit in terms of cooling, aesthetic pleasure and exposure to people. For the purposes of this article the maximum allowable mini oasis per site is 5% of the total landscapable area for commercial properties and 10% for multi-family properties.

MULTIFAMILY HOUSING UNIT - A mobile home in a mobile home park and any permanent housing unit having one or more common walls with another housing unit located in a multifamily residential structure, such as a unit in a duplex, triplex, fourplex, condominium development, town home development, or apartment complex.

NATIVE VEGETATION - Plants indigenous to the Sonoran Desert.

NEW DEVELOPMENT – 1) Any development except single family residential, approved by the XXXXX Planning Department on or after XXXXX. 2) Development approved by the Department prior to XXX, but not completed by XXXX shall also be considered new development. 3) For development for which landscaping is required by code, only that portion of a development approved by XXXX Planning Department on or after XXXX shall be considered new development.

PARKS - Public or privately owned recreation areas such as open space, recreation facilities and trails, parks, publicly owned undeveloped natural lands, and non-commercial picnic areas and campgrounds.

PUBLICLY OWNED - All property that is owned by a city, county, state or federal government, or “Special District” established by election or government action.

PUBLIC RIGHT-OF-WAY - The area of land acquired or obtained by the city, county, or state primarily for the use of the public for the movement of people, goods, vehicles, or storm water. For the purposes of this article the public right-of-way shall include the landscapable area between the street edge or curb and the adjacent property line.

RESPONSIBLE PARTY - The owner of the property, facility, or operation during the period of time the violation(s) is observed.

RETENTION BASIN-

ROTARY SPRINKLER HEAD - A device that projects streams of water in the form of small particles or droplets, through the air through rotation.

RUNOFF - Water that is not absorbed by the soil or landscape to which it is applied. Runoff occurs when water is applied too quickly (application rate exceeds infiltration rate), particularly if there is a severe slope. In this context, “runoff” does not include storm water runoff that is created by natural precipitation.

SPORTS FACILITY - One or more turf areas dedicated to playing a sport or sports (e.g. golf driving range, athletic fields for soccer, baseball, football etc.). For the purpose of this ordinance the facility would be privately owned and located on a commercial property, within a residential common area, or at a private school.

SUBMETERING - Separate metering of a portion of water use associated with a metered water-service connection.

TURF - A surface layer of earth containing regularly mowed grass. Turf grasses are considered high water use plants and include, but are not limited to, varieties of Bermuda and Bermuda hybrids, Rye grass and Buffalo grass.

TURF RELATED FACILITY - As defined and regulated by ADWR, § A.R.S. 45-566 (A)(2). Any facility with a high water use landscape [water-intensive landscaped] area of 10 or more acres, including cemeteries, golf courses, parks, schools or common areas within housing developments.

WATER ALLOTMENT- A calculated maximum amount of irrigation water per site per year, based on the total square footage of “landscapable” area for new development or existing landscaped area(s) for existing development. In conjunction with predetermined water application rates for low water use plants and mini oasis plants and evaporation rates for bodies of water.

WATER AUDIT - The on-site survey and measurement of irrigation efficiency and the generation of recommendations to improve management efficiency.

WATER BUDGET – An amount of water application to an irrigated landscape, based on the estimated water use of individual plants at maturity, calculated in order to stay within the site water allotment.

§ APPLICABILITY.

When available, use of reclaimed wastewater or other non-groundwater water supplies should be encouraged for all new developments with a landscapable area of ½ acre or more and should be required for irrigation at all new “turf related facilities” of 10 acres or more. These provisions do not apply to individual, single-family housing. Compliance with this ordinance does not exempt regulated persons from any other state or local requirements.

- (A) SECTION #, PLANTING RESTRICTIONS, WATER ALLOTMENTS AND WATER BUDGETS. This section applies to all new development, and expansions or major renovations to commercial, industrial and publicly owned facilities, common areas in multi-family and master planned communities, parks, cemeteries, athletic fields and private sports facilities, having a minimum of ½ acre of landscapable area. Provisions of this section and appended “Design Guidelines” also apply to commercial or industrial facilities that upon change of ownership, have a minimum of ½ acre of landscape area. Maximum mini-oasis allotments do not apply to “turf related facilities” (see definition, page 5) of 10 acres or more that are regulated by the Arizona Department of Water Resources, or to individual single family housing. The maximum allowable mini oasis per site is 5% of the total landscapable area for commercial properties and 10% for multi-family properties.
- (B) SECTION #, IRRIGATION SYSTEM STANDARDS AND IRRIGATION SUB-METERING REQUIREMENTS. This section applies to all new development, and expansions or major renovations to: commercial, industrial and publicly-owned facilities; common areas in multi-family and master planned communities; parks; cemeteries; athletic fields and private sports facilities that have a minimum of ½ acre of landscapable area.
- (C) SECTION #, POST INSTALLATION REQUIREMENTS, CERTIFICATION, AUDITS, ANNUAL REPORTING. This section applies to all new development, and expansions or major renovations to: commercial; industrial and publicly owned facilities; common areas in multi-family and master planned communities; parks; cemeteries; athletic fields and private sports facilities that have a minimum of ½ acre of landscapable area.
- (D) SECTION #, INSPECTION REQUIREMENTS. This section applies to all new development, and expansions or major renovations to: commercial, industrial and publicly owned facilities; common areas in multi-family and master planned communities; parks; cemeteries; athletic fields and private sports facilities that have a minimum of ½ acre of landscapable area. This section also applies to commercial or industrial facilities that, upon change of ownership, have a minimum of ½ acre of landscape area. This section does not apply to “turf related facilities” regulated by the Arizona Department of Water Resources or to individual single-family housing.

Certificates of occupancy for all new development with the exception of single-family residential shall depend upon compliance with all requirements of this article.

§ PLANTING RESTRICTIONS, IRRIGATION APPLICATION RATES, WATER ALLOTMENTS AND WATER BUDGETS.

PLANTING RESTRICTIONS: Shall be consistent with the requirements of all applicable landscape codes (jurisdiction to insert appropriate code(s), section reference).

New Construction:

- 1) Plants that are not on the official ADWR Drought Tolerant/Low Water Use Plant List or that require spray irrigation shall not be used in street medians, public rights of way, or outside of designated mini-oasis areas on properties subject to the provisions of this ordinance.
- 2) The total square footage dedicated to mini-oasis plants shall not exceed 5% of the total landscapable area for commercial properties and 10% for multi-family properties.
- 3) For retention/detention basins that are planted in turf or other high water use landscaping, the total square footage of high water use landscaping shall be multiplied by the 4.6 acre feet per acre allotment. This allotment shall be considered part of the mini-oasis allotment and deducted from the total mini-oasis allotment calculated for the site.

Exceptions:

- a. If the site is a cemetery, or park and includes high water use landscaping, turf area(s) and/or athletic field(s) that have been approved by the planning director, the annual allotment will be calculated on the total square footage of high water use landscaping plus the total square footage of low water use landscaping, multiplied by the assigned acre foot per acre application rates for each. The mature landscape must stay within the annual allotment. Future expansions or reductions in landscaped area will require submittal of the recalculated annual allotment, by the property owner, to the (presiding jurisdiction/department). Upon completion of the renovation the revised annual allotment will be enforced.

Expansion or Major Renovations:

If major renovations or expansions to an existing facility and/or landscaped areas result in increasing the total landscaped area to ½ acre or more:

- 1) Properties shall use plants from the most current ADWR Low Water Use/Drought Tolerant Plant List on 100% of the expanded or renovated landscape area.
- 2) No additional mini-oasis allowance shall be given for the newly expanded or renovated area(s), unless the total percentage of existing mini-oasis area on the site is less than the total mini-oasis allowance available under the current provisions of this ordinance.
- 3) The owner shall calculate and submit the new allotment based on existing landscaped areas, to the jurisdiction when applying for permits to renovate the property.

Reductions in Landscaped Area:

If there is a reduction in the total square footage of landscaped area on the site, the property owner shall calculate the areas currently planted in mini-oasis plants and in low water use plants and use the prescribed application rates to determine the new allotment for the site. The owner shall submit the new allotment to the jurisdiction when applying for permits to renovate the property.

Change of Ownership:

- 1) As per the appended "Design Guidelines," planting restrictions (e.g. maximum percentage of mini-oasis area) do not apply to property changing ownership that is not expanding or renovating the landscape; or,
- 2) To properties with less than ½ acre of landscapable area.
- 3) If major renovations or expansions to an existing facility and/or landscaped areas results in increasing the total landscapable area to ½ acre or more all requirements for major expansions or renovations apply.

IRRIGATION APPLICATION RATES:

The maximum, annual irrigation application rates used for mature vegetation shall be:

- 1) 1.5 acre feet per acre for low water use landscaping;
- 2) 4.6 acre feet per acre for turf or mini oasis landscaping; and
- 3) 5.8 acre feet per acre for bodies of water.

ANNUAL IRRIGATION WATER ALLOTMENT:

- 1) Establishes a limit per year on allowable water application to an irrigated landscape.

- 2) For each site, water use for each year shall be based on an end of the year landscape meter reading conducted by the property owner or their designated representative and shall not exceed the annual allotment.

New Facilities:

- 1) Irrigation allotments for each site are based on the total percentages of allowable mini-oasis area, which includes bodies of water (see definition) and low water use landscape areas shown on the landscape plan in conjunction with the maximum application rates above.
- 2) Shall be assigned prior to installation of the landscaping as per the procedures outlined in the appended "Design Guidelines".

Expansions and Major Renovations:

- 1) If the total existing landscaped area on the site is reduced to less than ½ acre, and
- 2) The site was built after the effective date of this ordinance, a new calculation of the water allotment based on the revised total square footage of remaining landscaped area(s) shall be submitted and adhered to by the property owner as per the procedures in the appended "design guidelines".

Change of Ownership:

- 1) New owners or their authorized representative shall calculate and submit the following to XXX (*jurisdictions to insert the appropriate division to receive and approve the calculations*): the annual site irrigation water allotment based on existing landscaping; target conservation budget; a projected monthly water budget and irrigation schedule based on historical evapotranspiration rates for the Tucson, as described in the appended "Design Guidelines"(reference section, page # in guidelines).
- 2) Allotments are based on the acreage of existing landscaped areas, separated into low water use areas, mini oasis areas and bodies of water, using the irrigation application rates above.

IRRIGATION WATER BUDGET:

The estimated irrigation budget is the annual irrigation requirement for mature landscape based on the number of plants on the site and their respective water requirements. The estimated annual irrigation water budget shall be calculated as per the requirements of the appended "Design Guidelines" for properties subject to the provisions of this ordinance including:

- 1) New Facilities;
- 2) Expansions and Major Renovations to Existing Facilities; and
- 3) Existing Facilities at Change of Ownership.

§ IRRIGATION SYSTEM STANDARDS AND IRRIGATION SUB-METERING REQUIREMENTS

IRRIGATION SYSTEM STANDARDS:

- 1) In general, irrigation systems shall be designed to be site-specific, reflecting plant type, soil type, infiltration rates, slopes, and prevailing wind direction.
- 2) New irrigation systems shall be designed to be in conformance with all provisions of this article and appended “Design Guidelines”.
- 3) All properties subject to the provisions of this ordinance shall maintain an irrigation controller(s), unless the irrigated portion of the site is less than ½ acre.
- 4) Choice of sprinkler heads shall conform with individual site conditions and be tested for uniformity of performance using the Center for Irrigation Technology’s (CIT) Sprinkler Profile and Coverage Evaluation (SPACE) program, or a comparable assessment acceptable to XXXX. The sprinkler heads shall have either distribution uniformity for the system, or a sprinkler distribution profile that is 10% above the audit requirements as described in Section (#) in the appended “Design Guidelines”.
- 5) The irrigation schedule shall be capable of meeting the peak watering requirements (sufficient time to apply the water within the hours available for irrigation).
- 6) The irrigation system shall be operated such that annual irrigation is within the allotted water budget.
- 7) Irrigation water shall not leave the landscaped areas and flow onto public roads, parking lots or sidewalks.

IRRIGATION SUB-METERING REQUIREMENTS

The requirement to install a separate irrigation meter or meters shall apply to:

- 1) New Developments that have a minimum of ½ acre of landscapable area.
- 2) Expansions and Major Renovations to a site that results in increasing landscaped areas to ½ acre or more.

- a. For sites where reductions in the square footage of landscaped areas results in a total landscaped area of less than ½ acre, and that had landscape plans that were approved prior to the effective date of this provision, installation of a separate irrigation meter is not required.
- 3) Properties changing ownership, if they have a minimum of ½ acre of existing landscaped area.

§ POST INSTALLATION REQUIREMENTS- AUDITS, CERTIFICATION, ANNUAL REPORTING.

AUDIT REQUIREMENTS:

- 1) Provisions of this section apply only to New Facilities as defined in this article, unless the governing jurisdiction mandates an audit due to suspected or reported non-compliance with the provisions of this ordinance.
- 2) New facilities shall have an on-site Landscape Irrigation Audit of the newly installed irrigation system performed by a Certified Landscape Irrigation Auditor, certified by the Irrigation Association, prior to issuance of a certificate of occupancy issued by XXX.
 - a. The auditor shall be independent of the property owner and of all contractors associated with the property.
 - b. The audits shall be conducted in accordance with the current edition of the Landscape Irrigation Auditor's Handbook, published by the Irrigation Association. The average distribution uniformity results for the site audit shall be a minimum of 50% distribution uniformity (d.u.) for all fixed spray systems, 65% d.u. for all rotary spray systems and 80% emission uniformity for drip irrigation.
 - c. The results of the audit shall be provided to XXXX in a letter or other form acceptable to XXXX and shall be signed by the Auditor.
 - d. Compliance with this provision is required before XXXX will issue a Certificate of Occupancy for new property or a Certificate of Substantial Completion for a new park development. *(Actual title of certificate to be inserted by each jurisdiction).*

CERTIFICATION:

- 1) A Certificate of Substantial Completion Checklist shall be submitted as per the appended "Design Guidelines" to (the approving authority) by a Landscape

Architect or Certified Irrigation Designer registered or certified in the State of Arizona.

ANNUAL REPORTING:

- 1) The property owner or their authorized representative is responsible for recording the irrigation sub-meter(s) reading and submitting the annual water use report form provided by XXX (*insert the jurisdiction*), to (*the department or staff person designated by - jurisdiction*).
- 2) The irrigation meter or meters shall be read annually on the last day of the calendar year by the property owner, or their designated representative to determine compliance with the approved irrigation water allotment for the site.

§ INSPECTION PROCEDURES (procedures to be inserted by each jurisdiction)

§ VARIANCES AND APPEALS (language to be inserted by each jurisdiction)

(Ord. ; Am. Ord.) Penalty, see §

The XXX shall be responsible for the enforcement of this article. The XXX may prescribe policies, rules, or regulations to carry out the intent and purposes of this article.

(A) Design Stage – Request for variances are available on a case by case basis.

(Ord. ; Am. Ord.)

§ COMPLIANCE (language to be inserted by each jurisdiction)

(Ord.; Ord.) Penalty, see §

§ § FEES ASSESSMENT. (language and fees to be determined and inserted by each jurisdiction)

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